

US EPA ARCHIVE DOCUMENT

DATA EVALUATION RECORD

1. Chemical: Sulfosate (Shaughnessy No. 128501)
2. Test Material: Formulated product: SC-0224 4-LC (liquid concentrate)  
  
40.8% ai (as per proposed label of study sponsor)
3. Study/Action Type: Aquatic invertebrate acute LC<sub>50</sub>  
  
Daphnia magna
4. Study ID: The acute toxicity of SC-0224 4-LC to Daphnia magna Straus  
  
Biospherics, Inc.  
Project No. 82-E-1119D  
Report date: November 1982  
Study sponsor: Stauffer Chemical Company  
Study location: EPA Accession No. 250545
5. Reviewed by: James D. Felkel  
Wildlife Biologist  
EEB/HED  
Signature: *James D. Felkel*  
Date: *1-20-87*
6. Approved by: Henry Craven  
Supervisory Biologist  
EEB/HED  
Signature: *Henry T. Craven*  
Date: *1/21/87*
7. Conclusions:  
  
This study is scientifically sound. With a 48-hr LC<sub>50</sub> of 1.6 mg/L, this formulation is considered "moderately toxic" to D. magna. A data requirement for this study may be fulfilled with submission of photoperiod information and confirmation of exact formulation composition.
8. Recommendations:  
  
The study may be upgraded from supplemental to core for this formulation, with the information cited in #7 above.
9. Background: N/A.
10. Discussion of Individual Test: N/A.

11. Materials and Methods:

a. Test animals - Daphnia magna from lab culture; < 20 hr old.

b. Dosage form - In static bioassay, no solvent.

c. Study Design

(1) Range-finding: - 250 mL beakers  
- 5 instars/vessel  
- 0.1, 1.0, 10, 100, 1000 mg/L  
(with duplicate concentrations)  
- 48 hr

(2) Definitive: - 250 mL beakers  
- 10 neonates/vessel  
- control, 0.8, 1.4, 2.5, 4.5,  
and 8 mg/L (four replicates of each)  
- DO measured at the start and end  
of test; temp. measured daily.  
- 48 hr  
- dilution water quality pH 7.0,  
hardness 150 mg/L as CaCO<sub>3</sub>,  
alkalinity 112 mg/L as CaCO<sub>3</sub>,  
source - 400' well

(3) Statistics - Moving average method (Stephan 1979).

12. Reported Results:

DO - 7.8 to 8.6 mg/L

pH - 6.9 to 7.3

Mean temp.- 20.3 °C (20 to 20.5 °C)

24-hr LC<sub>50</sub> - 2.0 mg/L (1.8 to 2.3 mg/L)

48-hr LC<sub>50</sub> - 1.6 mg/L (1.4 to 1.8 mg/L)

13. Study Author's Conclusions/QA Measures:

See above reported results. Test ". . . inspected by the Quality Assurance Unit according to Biospherics SOP 2.3.4 'QA Study Inspections'."

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedure: Reported procedures for the definitive test were generally consistent with current guidelines (1982). However, photoperiod was not reported and water temperatures were measured daily rather than continuously,

as recommended by the Committee on Methods for Toxicity Tests with Aquatic Organisms (1975). Also, dilution water was harder than recommended (150 mg/L as CaCO<sub>3</sub> vs. 40 to 48 mg/L as CaCO<sub>3</sub> recommended).

- b. Statistical Analysis: A check of the statistical analysis was conducted and is attached.
- c. Discussion/Results: An approximate LC<sub>50</sub> is determined to be 1.6 mg/L, (moving average method), the same as that reported in the study. The dose-response curve is very steep, with 10% mortality at 1.4 mg/L (7.69% adjusted) and 100% mortality at 2.5 mg/L. A reference toxicant test with another chemical was cited by the study authors, but is not required by EPA. The formulated product appears to be approximately 44X as toxic as technical material (tech. LC<sub>50</sub> with Daphnia reported in August 9, 1983 EEB review: 71 mg/L).
- d. Adequacy of the Study:
  - (1) Classification: Supplemental for this formulation.
  - (2) Rationale: While the study is scientifically sound, the photoperiod should be reported and the registrant must confirm whether the composition of formulation is exactly as described in the June 3, 1983 Confidential Statement of Formula.
  - (3) Reparability: Study may be upgraded to core for this formulation with submission of information cited above.

15. Completion of One-Liner for Study:

One-liner generated automatically by current computer program.

16. CBI Appendix: N/A.

NOTE: BECAUSE THERE WAS CONTROL MORTALITY, AND NONE OF THE LOWER CONCENTRATIONS PRODUCED ZERO MORTALITY, THE DATA HAS BEEN SUBJECTED TO ABBOTT'S CORRECTION

J. FELKEL SC-0224 4LC DAPHNIA MAGNA 12-15-86

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
8	39	39	100	0
4.5	39	39	100	0
2.5	39	39	100	0
1.4	39	3	7.6923	0
.8	39	2	5.1282	0

BECAUSE THE NUMBER OF ORGANISMS USED WAS SO LARGE, THE 95 PERCENT CONFIDENCE INTERVALS CALCULATED FROM THE BINOMIAL PROBABILITY ARE UNRELIABLE. USES THE INTERVALS CALCULATED BY THE OTHER TESTS.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 1.773263.

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS		
3	3.162856E-02		1.630504	1.44054	1.828456

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
9	3.297659	13.69532	0

A PROBABILITY OF 0 MEANS THAT IT IS LESS THAN 0.001.

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 8.580816

95 PERCENT CONFIDENCE LIMITS = -7.001479 AND 24.16311.

LC50 = 1.679125

95 PERCENT CONFIDENCE LIMITS = 0 AND +INFINITY

LC10 = 1.194204

95 PERCENT CONFIDENCE LIMITS = 0 AND +INFINITY

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